

**AMENDMENTS TO THE SPECIFICATION**

Page 1, second paragraph, please amend as follows:

The security system has been well known, in which in the event that an unauthorized entry of a human being is detected during the nighttime within the detection area outside a building such as, for example, a dwelling house or a factory, a security light is turned on continuously for a predetermined length of time, or a flashing light, i.e., a mode of lighting in which lighting and extinction are cyclically repeated, is triggered at the intruder at late night for alert purpose. By way of example, the Japanese Laid-open Utility Model Publication No. 7-29691 discloses the use of a timer, which is activated in response to detection of an intruder and to switch from the continuous lighting for illumination purpose to the flashing for alert purpose depending on the set-up of the timer. Also, depending on the time ~~zone~~period in the nighttime after sunset, the continuous lighting and the flashing can be manually selected one at a time.

Page 3, paragraphs 1 and 2, please amend as follows:

In order to accomplish the above described object, the present invention provides a security lighting apparatus, which includes a human body detector for detecting a human body within a detection area, an illuminator for illuminating the detection area when a human body is detected, a time ~~zone~~period setting device for setting a specific time ~~zone~~period during which a security check must be made, and an alert device operable, when the human body is detected during the specific time ~~zone~~period, to issue an alert or threatening to an intruder entering the detection area.

According to the present invention, in the event that the human body is detected by the human body detector during the specific time ~~zone~~period defined by the time ~~zone~~period setting device, an alert is issued to an intruder entering the detection area and, accordingly, the timing at which the alert is issued can easily and properly be set as a result of the time ~~zone~~period set for security purpose.

Paragraph 4, please amend as follows:

Also preferably, the time ~~zone~~period setting device may include a sunset detecting unit for detecting sunset, a start time setting unit for setting a start time of the specific time ~~zone~~period for security check, or a security operation start time as a length of time passed subsequent to sunset, an end time setting unit for setting an end time of the specific time ~~zone~~period, or a security operation end time, as a length of time passed subsequent to sunset, and an elapsed time measuring unit for measuring a length of time passed from sunset. According to this preferred feature, when the length of elapsed time measured attains the start time defined by the length of time passed subsequent to sunset, the security operation starts. Accordingly, the specific time ~~zone~~period for the security operation can be determined in dependence on change of the hour of sunset dependent on the season and/or the geographic conditions in which a house is built and, therefore, the timing at which the alert is issued can be further easily and properly optimized.

Page 4, paragraphs 1 and 2, please amend as follows:

In a preferred embodiment, the time ~~zone~~period setting device includes a sunset detecting unit for detecting sunset, a sunrise detecting unit for detecting sunrise, a start time setting unit for calculating a start time of the specific time ~~zone~~period to a midtime by calculating such midtime between sunset and sunrise, an end time setting unit for setting an end time of the specific time ~~zone~~period as a length of time passed subsequent to the midtime, and an elapsed time measuring unit for measuring a length of time passed from midtime. According to this preferred feature, since the specific time ~~zone~~period starts at the start time set to be the midtime between sunset and sunrise, the specific time ~~zone~~period for the security guard can be accurately defined to suit the change of the hour of sunset depending on the season and the geographic conditions of the house. Therefore, the timing at which the security operation starts can be further easily and properly set. Also, since the security operation is terminated when the measured length of elapsed time comes to be equal to the end time so set, an end timing of the security operation can easily be optimized.

In another preferred embodiment, the time ~~zone~~period setting device may include a sunset detecting unit for detecting sunset, a sunrise detecting unit for detecting sunrise, a past data accumulating unit for accumulating a predetermined number of past sunset/sunrise hours, a start time setting unit for a start time of the specific time ~~zone~~period to a midtime by calculating such midtime between sunset and sunrise, which is averaged from the sunset/sunrise hours contained in the past data, an end time setting unit for setting an end time of the specific time ~~zone~~period as a length of time passed from the midtime, and an elapsed time measuring unit for

measuring a length of time passed from the start time to the end time. According to this preferred feature, at the start time, which is the midtime, calculated based on the accumulated past data, the timing at which the security of operation is initiated can be automatically optimized.

Page 5, first and second paragraphs, please amend as follows:

Preferably, the time ~~zone~~period setting device may include a clock for clocking, a start time setting unit for setting a start time of the specific time ~~zone~~period, and an end time setting unit for setting an end time of the specific time ~~zone~~period. According to this preferred feature, after the time clocked by the clock reaches the start time and when the human body is subsequently detected by the human body detector, the alert or threatening is initiated. Accordingly, the timing at which the alert is initiated can be easily and properly set with a simple structure.

In the security lighting apparatus according to a still further preferred embodiment of the present invention, the time ~~zone~~period setting device includes a home return determining unit for determining a return of a house resident back to a house, a start time setting unit for setting a start time of the specific time ~~zone~~period as a confirmation hour at which it has been confirmed that all of house residents returned home, an end time setting unit for setting an end time of the specific time ~~zone~~period, as a length of time passed from the confirmation hour, and an elapsed time measuring unit for measuring a length time passed from the confirmation hour, and an elapsed time measuring unit for measuring a length time passed from the confirmation hour.

According to this preferred feature, the alert can be initiated when the human body is detected by the human body detector when and after return of all of the family members expected to return home has been confirmed and, accordingly, the timing at which the alert is initiated can be automatically optimized without allowing any of the family members to feed unpleasant.

Page 7, paragraphs 2-4, please amend as follows:

Referring first to Fig. 1, there is shown an optical arrangement showing the environment, in which the security lighting apparatus according to a first preferred embodiment of the present invention is disposed. The security lighting apparatus shown therein is of a type fixed to an outer wall surface of a building such as, for example, a dwelling house or a factory for detecting an intruder illegally entering one of a plurality of detection ~~zone~~periods A1, A2, A3 and A4 defined in the outdoor area of the building. This security lighting apparatus includes a human body detector 1 and an illuminator 11 for illuminating the detection ~~zone~~periods A1 to A4.

The human body detector 1 is of, for example, a passive type infrared beam (PIR) system and includes a pair of infrared detecting elements 2 and 3, each in the form of a pyroelectric element, housed within a casing 41. This human body detector 1 is, when in use, fixed to an outer wall surface 4 of, for example, a building. The detection ~~zone~~periods A1 to A4, which are aimed at by the infrared detecting elements 2 and 3, are determined by optical systems 51 and 52 such as, for example, Fresnel lenses fixedly mounted on the casing 41 in alignment with the respective infrared detecting elements 2 and 3 within the casing 41. As is well known to those skilled in the art, infrared energies emanating from a human body H appearing within any one of

the detection ~~zone~~periods A1 to A4 are, after having been collected by the optical systems 51 and 52, captured by the associated infrared detecting elements 2 and 3 to eventually determine the presence of the human body H within any one of the detection ~~zone~~periods A1 to A4. The human body H referred to above may be an intruder entering into any one of the detection ~~zone~~periods A1 to A4.

The illuminator 11 may include, for example, a halogen lamp or a high voltage discharge lamp, and in the event that the human body detector 1 detects the presence of the human body H within any one of the detection ~~zone~~periods A1 to A4, the illuminator 11 can be continuously turned on to illuminate the detection ~~zone~~periods A1 to A4 for a predetermined length of time, but can blink (or flash) for alert purpose if the human body H so detected is an intruder at night. In the illustrated embodiment, the alert is accomplished by the flashing light emitted by the illuminator 11.

Page 8, first paragraph, please amend as follows:

Fig. 2 illustrates a circuit block diagram showing an electric circuit employed in the security lighting apparatus of the present invention. As shown therein, the security lighting apparatus includes an alert time ~~zone~~period setting device 19 for setting a specific time ~~zone~~period for security operation, i.e., the period of a day during which the security check must be made in a manner as will become clear from the subsequent description. In the illustrated embodiment, the alert time ~~zone~~period referred to above is set to the time span in the night between the hour of each day after passage of a predetermined length of time subsequent to

| sunset to the hour of sunrise in the next morning. This alert time ~~zone~~period setting device 19 includes a light meter 5 for measuring the ambient brightness, a human body detecting circuit 6 for processing detection pulse signals, fed from the infrared detecting elements 2 and 3, and outputting a human body detection signal, and a night determining unit 10. The night determining unit 10 in turn includes a sunset detecting circuit 7 for detecting sunset, a sunrise detecting circuit 8 for detecting sunrise and is operable to determine the nighttime in reference to respective signals indicative of sunset and sunrise fed from the sunset and sunrise detecting circuits 7 and 8.

Page 9, paragraphs 1-3, please amend as follows:

The security lighting apparatus of the present invention also includes an illuminator drive circuit 12 for driving the illuminator 11 when the human body is detected by the human body detector 1 during the specific time ~~zone~~period in the nighttime, which is determined by the night determining unit 10.

| The alert time ~~zone~~period setting device 19 referred to above includes a start time setting unit 14a for setting the start time of the specific time ~~zone~~period, at which the alert or threatening by means of flashing can be initiated, as the length of time passed subsequent to sunset detected by the night determining unit 10, and an end time setting unit 14b for setting the end time of specific time ~~zone~~period, at which the alert can be terminated, as the hour of sunrise detected by the sunrise detecting unit. By allowing the user of the security lighting apparatus to input the

start time to the start time setting unit 14a, the start timing, at which the flashing can be triggered on, can be set as desired.

The alert time ~~zone~~period setting device 19 also includes an elapsed time measuring unit 15, which may be in the form of an elapsed time counting timer capable of measuring the length of time passed subsequent to sunset, and a comparing circuit 16 for comparing the counted length of elapsed time with the start time or the end time. An illuminator control circuit 20 is operable to activate the illuminator drive circuit 12, when the measured length of elapsed time attains the preset start time and inactivates the illuminator drive circuit 12 at the end time. The start time setting unit 14a, the end time setting unit 14b, the elapsed time counting means 15, the comparing circuit 16 and the illuminator control circuit 20 are all incorporated in a control device 21 for controlling the security lighting apparatus as a whole.

Page 10, first paragraph, please amend as follows:

The security lighting apparatus of the present invention furthermore includes a camera 33 for taking pictures of the detection ~~zone~~periods A1 to A4 when the flashing is triggered on by the illuminator drive circuit 12, and a picture taking control unit 34 for activating the camera 33.

Last paragraph, please amend as follows:

By way of example, assuming that the start time T2 is set to 7 hours during the winter season and 5 hours during the summer season, the alert start timing t2 will be generally zero o'clock a.m. On the other hand, if an high level signal (human body detection signal shown by



(b) in Fig. 3) indicative of the detection of a human body is inputted to an AND circuit L1 to which the high level signal (sunset detection signal) indicative of the detection of sunset is inputted, the lighting timer 17 starts its counting operation. When during the period in which the lighting interval timer 17 undergoes the counting indicating the detection of the human body and the detection of sunset, the high level signal from the comparing circuit 16 is supplied to an AND circuit L5, a flashing signal is outputted from the AND circuit L5 to the illuminator drive circuit 12 to activate it, thereby causing the illuminator 11 to emit a flashing aiming at the detection ~~zone~~periods A1 to A4 for alert purpose (as shown by (c) in Fig. 3). In this way, the flashing is carried out during the particular length of time between the timing t2 to the timing t3.

Page 11, paragraphs 1-3, please amend as follows:

On the other hand, up until the start time T2, which is the measured length of elapsed time subsequent to the detection of sunset at the timing t1, the low signal is outputted from the comparing circuit 16 and is converted into a high level signal by a NOT circuit L4. When the high level signal from the NOT circuit L4 is inputted to the AND circuit L3 during the period in which the lighting interval timer 17 undergoes the counting indicating the detection of the human body and the detection of sunset, a continuous lighting signal is outputted from the AND circuit L3 to the illuminator drive circuit 12 to activate the latter so that for a predetermined length of time, for example, 60 seconds, the illuminator 11 continuously illuminates the detection ~~zone~~periods A1 to A4 as shown by (c) in Fig. 3, to provide illumination for the returning house residents.

When the sunrise detecting circuit 8 detects sunrise at a timing t3 (shown by (a) in Fig. 3), a high level signal (the sunrise detection signal indicative of sunrise) is supplied from an inverted Q output of the RS flip-flop 13 to the elapsed time counting timer 15 and, also, an low signal is supplied from the Q output of the RS flip-flop 13 to the AND circuit L1. Then, the elapsed time counting timer 15 is reset with the counting halted consequently and, at the same time, the lighting interval timer 17 is reset with the counting halted consequently. Accordingly, the time ~~zone~~period for alert purpose is terminated upon sunrise.

The period from the timing (sunset) t1 to the timing t3 (sunrise) is the nighttime T1 and the interval T3 from the timing t2 (the start time) to the timing t3 (sunrise) is the specific time ~~zone~~period in the nighttime T1. See (a) in Fig. 3. It is to be noted that the end time setting unit 14b referred hereinabove may be so designed as to set the length of time elapsed subsequent to sunset, not to set the timing of detection of sunrise as the end time of the specific time ~~zone~~period.

Page 12, second paragraph, please amend as follows:

Also, the control device 21 is operable to instruct the picture taking control unit 34 to activate the camera 33, as shown by (d) in Fig. 3, so that when the flashing is carried out by the illuminator drive circuit 12, the detection ~~zone~~periods A1 to A4 (See Fig. 1.) can be photographed. By way of example, a plurality of still pictures can be taken. In such case, a first part of the flashing may be a continuous lighting for picture taking purpose by means of the

camera 33 as shown in an enlarged portion of (c) in Fig. 3. Where no picture taking is carried out, the flashing takes place for the entire predetermined length of time.

Page 13, second paragraph, please amend as follows:

More specifically, as shown in Fig. 4, the security lighting apparatus according to the second embodiment includes a reference clocking circuit 18 capable of functioning as a clock for clocking, a start time setting unit 14Aa for setting a start time of the specific time ~~zone~~period during which the flashing can start, an end time setting unit 14Ab for setting an end time of the specific time ~~zone~~period, a comparing circuit 16 for comparing the clocking of the clock circuit 18 with the start time or the end time. The illuminator control circuit 20 activates the illuminator drive circuit 12 when the human body is detected by the human body detector 1 when the clocking of the clock attains the start time. The start time may be set to, for example, zero o'clock a.m. by the start time setting unit 14Aa. The start time setting unit 14Aa, the end time setting unit 14Ab, the clock 18, the comparing circuit 16 and the illuminator control circuit 20 are all incorporated in the control device 21 for controlling the security lighting apparatus as a whole.

Page 14, paragraphs 2 and 3, please amend as follows:

Fig. 5 illustrates a circuit block diagram of the electric circuit employed in the security lighting apparatus according to a third preferred embodiment of the present invention, which will now be described. Unlike the previously described first embodiment, the third embodiment is

such that in place of the setting of the start time of the specific time ~~zone~~period by inputting such start time, the timing at which the specific operation starts can be automatically optimized by calculating and setting the midnight hour (midtime).

More specifically, as shown in Fig. 5, the security lighting apparatus according to this third embodiment includes a time ~~zone~~period setting device 19B. This time ~~zone~~period setting device 19B in turn includes a past data accumulating unit 22 for accumulating a predetermined number of results of determination of the sunset/sunrise hours done by the night determining unit 10 in the past, a start time setting unit 23a for calculating a midtime from sunset to sunrise, which is averaged from the past data on the sunset/sunrise hours, and to set the start time of the specific time ~~zone~~period during which the alert is initiated, to the later hour (midtime), an end time setting unit 23b for setting the end time of the specific time ~~zone~~period, as the length of time from the midtime, and a comparing circuit 16 for comparing the length of elapsed time from sunset and from the midtime, measured by the elapsed time measuring timer 15, with the calculated midtime and the length of time from the midtime.

Page 15, last paragraph, please amend as follows:

In this security lighting apparatus shown in and described with reference to Fig. 5, the past data accumulating unit 22 accumulates data on the nighttime T1 based on the sunset/sunrise hours during a period starting from, for example, the preceding day to seven days ago, and the start time setting unit 23a calculates, for example, 50% or 60% of the average time of the accumulated data on the nighttime T1 to define the midnight hour (midtime) t2 (as shown by (a)

in Fig. 3). It is, however, to be noted that the hour of the day, which is one hour after or before the 50% of the average time, may be set as the midnight hour. By so doing, the illuminator control circuit 20 causes the illuminator drive circuit 12 after the timing coinciding the midnight hour (midtime)  $t_2$  so defined, to be activated so that the illuminator 11 can flash when the human body is detected. The specific time ~~zone~~period during which the flashing can take place terminates when the length of time elapsed from the midnight hour (midtime)  $t_2$  attains the end time.

Page 16, second paragraph, please amend as follow:

Although in the foregoing embodiment shown in and described with reference to Fig. 5, the past data accumulating unit 22 has been described as accumulating the sunset/sunrise hours for the predetermined past period so that the midtime can be calculated from the average value of the past sunset/sunrise hours, this may be dispensed with and, instead, the midtime between sunset and sunrise may be calculated based on data on the previous day so that such midtime can be set as the start time of the specific time ~~zone~~period for the security operation.

Fourth paragraph, please amend as follows:

More specifically, as shown in Fig. 6, the security lighting apparatus includes a time ~~zone~~period setting device 19C, which in turn includes a home return determining unit 24 for determining a home return of a house resident, a start time setting unit 25a for setting the hour, on which it has been confirmed that all of the family members due to return home returned

home, as the start time of the specific time ~~zone~~period for security operation during which the flashing can be carried out and an end time setting unit 25b for setting a predetermined length of time after the hour of confirmation of return of the family members, as the end time of the specific time ~~zone~~period.

Page 18, second paragraph, please amend as follows:

Although in any one of the foregoing embodiments, the time ~~zone~~period of each day, during which the security lighting apparatus is activated for security guard, has been determined as a specific period in the nighttime, the time ~~zone~~period may be a specific period during the daytime other than the nighttime particularly where the security lighting apparatus is used in, for example, a relatively dark area within the building.

Last paragraph, please amend as follows:

It is also to be noted that in any one of the foregoing embodiments the human body detector 1 has been shown and described as being of the passive type infrared beam (PIR) system, the human body detector 1 may be of an AIR system capable of detecting an object by projecting near infrared rays of light as a detection wave and detecting a portion of the near infrared rays of light reflected from such object. Alternatively, an active type ultrasonic or radio sensor made up of a transmitting element capable of transmitting ultrasonic waves or radio waves as a detection wave and a receiving element capable of receiving a portion of the ultrasonic or radio waves reflected from an object to be detected can also be employed for the

Amendment Under 37 C.F.R. § 1.111  
Serial No.: 10/522,135  
SUGHRUE MION, PLLC Ref: Q85896

human body detector 1. Yet, the detection of a human body can be accomplished by the use of a switch operatively associated with detection of disturbed radio waves or with selective closure and opening of a physical shielding means for dividing the area into inner and outer ~~zone~~periods.

Page 19, first paragraph, please amend as follows:

As hereinbefore fully described, according to the present invention, when the human body is detected by the human body detector during the time ~~zone~~period specified by the time ~~zone~~period setting device, alert can be issued to an intruder entering the detection area and, therefore, the timing at which the alert is issued can easily and properly be set by the setting of the specific time ~~zone~~period during which a security check must be made.